

REMARKS

The Office Action mailed September 21, 2004 has been carefully reviewed and the following remarks are made in consequence thereof.

Claims 1-8, 10-17, and 19-20 are now pending in this application. Claims 1-20 stand rejected. Claims 9 and 18 have been canceled.

The rejection of Claims 1-3, 5-12, 14, and 16-20 under 35 U.S.C. § 102(b) as being anticipated by either Kraig (U.S. Pat. No. 4,012,165) or Schnell (U.S. Pat. No. 3,012,709) is respectfully traversed.

Kraig describes a fan blade (12) including a tip (14) extends radially outward from a rotor (16). A mid span shroud (18) separates the blade into a radially inward region (20) and a radially outward region (22). In operation, a working medium (24) is directed towards the blade and is divided by the shroud into a radially inward flow path (26) and a radially outward flow path (28). A fan case (30) radially surrounds the tips of the blades and includes a starting and stabilizing door (32) that opposes the tips of the blades. The door forms the outer wall of the outward flow path and is moveable to vary a cross sectional area of the outward flow path. Applicants respectfully note that although Kraig recites "additional airfoil contours which are capable of gradually diffusing supersonic airflow", Kraig does not describe in detail the relative location of the structure or the location of the contours. (Col. 4, lines 33-34). Furthermore, Figures 2-4 do not show in sufficient detail the structure or nature of the contours, but rather Figures 2-4 appear to illustrate that the contours extend substantially radially from the tip of the blade through the blade to the root of the blade.

Schnell describes a blade including a leading edge (1) and a trailing edge (2). Two boundary layer collars (3 and 4) are positioned on the blade one behind the other in the radial direction. The inner collar (3) extends about two-thirds the length of the blade along a blade suction side (5) and extends about one-half the length of the blade along a blade pressure side (6) around the leading edge. The second collar (4) extends only along the blade suction side to the leading edge. In another embodiment, a collar (7) is substituted for the inner collar and extends along the entire blade cross-section.

Claim 1 recites “a method for fabricating a rotor blade for a gas turbine engine, said method comprising forming an airfoil including a first side wall and a second side wall that each extend in radial span between an airfoil root and an airfoil tip, and wherein the first and second side walls are connected at a leading edge and at a trailing edge...and forming a winglet that is positioned a distance from the leading edge and trailing edge and extends outwardly from at least one of the airfoil first side wall and the airfoil second side wall and positioned a radial distance from the airfoil tip, such that a radius extends between the winglet and at least one of the airfoil first side wall and the second side wall.”

Neither Kraig nor Schnell, describe nor suggest a method for fabricating a rotor blade for a gas turbine engine, wherein the method includes forming an airfoil including a first side wall and a second side wall that each extend in radial span between an airfoil root and an airfoil tip, and wherein the first and second side walls are connected at a leading edge and at a trailing edge and forming a winglet that is positioned a distance from the leading edge and trailing edge and extends outwardly from at least one of the airfoil first side wall and the airfoil second side wall and positioned a radial distance from the airfoil tip, such that a radius extends between the winglet and at least one of the airfoil first side wall and the second side wall. Specifically, neither Kraig nor Schnell, describe nor suggest a method for fabricating a rotor blade for a gas turbine engine, wherein the method includes forming a winglet that is positioned a distance from the leading edge and trailing edge and extends outwardly from at least one of the airfoil first side wall and the airfoil second side wall and positioned a radial distance from the airfoil tip. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, and Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Kraig or Schnell.

Claims 2, 3, and 5 depend from independent Claim 1. When the recitations of Claims 2, 3, and 5 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claims 2, 3, and 5 are likewise patentable over Kraig or Schnell.

Claim 6 recites “an airfoil for a gas turbine engine, said airfoil comprising a leading edge...a trailing edge...a tip...a first side wall extending in radial span between an airfoil root and said tip, said first side wall defining a first side of said airfoil...a second side wall connected to said first side wall at said leading edge and said trailing edge, said second side wall extending in radial span between the airfoil root and said tip, said second side wall defining a second side of said airfoil...and a winglet positioned a distance from the leading edge and trailing edge and extending outwardly from at least one of said first side wall and said second side wall such that a radius extends between said winglet and at least one of said first and second side walls, said winglet is a radial distance from said airfoil tip.”

Neither Kraig nor Schnell, describe nor suggest an airfoil for a gas turbine engine, the airfoil includes a leading edge, a trailing edge, a tip, a first side wall extending in radial span between an airfoil root and the tip, the first side wall defining a first side of the airfoil, a second side wall connected to the first side wall at the leading edge and the trailing edge, the second side wall extending in radial span between the airfoil root and the tip, the second side wall defining a second side of the airfoil, and a winglet positioned a distance from the leading edge and trailing edge and extending outwardly from at least one of the first side wall and the second side wall such that a radius extends between the winglet and at least one of the first and second side walls, the winglet is a radial distance from the airfoil tip. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, and Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge. Accordingly, for at least the reasons set forth above, Claim 6 is submitted to be patentable over Kraig or Schnell.

Claims 7-12 depend from independent Claim 6. When the recitations of Claims 7-12 are considered in combination with the recitations of Claim 6, Applicants submit that dependent Claims 7-12 are likewise patentable over Kraig or Schnell.

Claim 14 recites “a gas turbine engine comprising a plurality of rotor blades, each said rotor blade comprising an airfoil comprising a leading edge, a trailing edge, a first side wall, a second side wall, and at least one winglet extending outwardly from at least one of said first side wall and said second side wall such that a radius is formed between said

winglet and at one of said first and second side walls, said airfoil first and second side walls connected axially at said leading and trailing edges, said first and second side walls extending radially from a blade root to an airfoil tip, said at least one airfoil winglet is positioned a distance from the leading edge and trailing edge and is a radial distance from said airfoil tip.”

Neither Kraig nor Schnell, describe nor suggest a gas turbine engine that includes a plurality of rotor blades, each rotor blade includes an airfoil including a leading edge, a trailing edge, a first side wall, a second side wall, and at least one winglet extending outwardly from at least one of the first side wall and the second side wall such that a radius is formed between the winglet and at one of the first and second side walls, the airfoil first and second side walls are connected axially at the leading and trailing edges, the first and second side walls extending radially from a blade root to an airfoil tip, the at least one airfoil winglet is positioned a distance from the leading edge and trailing edge and is a radial distance from said airfoil tip. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, and Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Kraig.

Claims 16-20 depend from independent Claim 14. When the recitations of Claims 16-20 are considered in combination with the recitations of Claim 14, Applicants submit that dependent Claims 16-20 are likewise patentable over Kraig or Schnell.

For at least the reasons set forth above, Applicant respectfully requests that the Section 102 rejection of Claims 1-3, 5-12, 14, and 16-20 be withdrawn.

The rejection of Claims 4, 13, and 15 under 35 U.S.C. § 103(a) as being unpatentable over Kraig or Schnell in view of Mendham (U.S. Pat. No. 5,269,057) is respectfully traversed.

Kraig and Schnell are described above. Mendham describes a method for replacing airfoil components including the steps of identifying a portion of the airfoil to be replaced, removing the portion by a non-conventional machining process, and forming a replacement

member utilizing a non-conventional cutting process. The steps of cutting and machining may be performed by an electro-chemical machining process.

Applicant respectfully submits that the Section 103 rejection of the presently pending claims is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been an obvious (and well known within the art) to one of ordinary skill in the art to "modify the presented prior art devices (Kraig and Schnell) by incorporating an electro-chemical machining process as taught by Mendham, for the purpose of using a machining process as claimed" More specifically, it is respectfully submitted that a prima facie case of obviousness has not been established. As explained by the Federal Circuit, "to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant." In re Kotzab, 54 USPQ2d 1308, 1316 (Fed. Cir. 2000). MPEP 2143.01. Moreover, the Federal Circuit has determined that:

[I]t is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious. This court has previously stated that "[o]ne cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

In re Fitch, 23 USPQ2d 1780, 1784 (Fed. Cir. 1992). Further, under Section 103, "it is impermissible...to pick and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art." In re Wesslau, 147 USPQ 391, 393 (CCPA 1965). Rather, there must be some suggestion, outside of Applicant's disclosure, in the prior art to combine such references, and a reasonable expectation of success must be both found in the prior art, and not based on Applicant's disclosure. In re Vaeck, 20 U.S.P.Q.2d 1436 (Fed. Cir. 1991). In the present case, neither a suggestion nor motivation to combine the cited art, nor any reasonable expectation of success has been shown.

Although it is asserted within the Office Action that Kraig and Schnell teach the present invention except for forming the winglet using an electro-chemical machining process, and that Mendham teaches removing a portion of an airfoil utilizing an electro-

chemical machining process, no motivation nor suggestion to combine the cited art has been shown. Rather, Applicants submit that Kraig and Schnell teaches away from Mendham in that Kraig describes a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, and Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge, while in contrast, Mendham describes removing a portion of an airfoil utilizing an electro-chemical machining process. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicant requests that the Section 103 rejection of Claims 4, 13, and 15 be withdrawn.

Moreover, if art "teaches away" from a claimed invention, such a teaching supports the nonobviousness of the invention. U.S. v. Adams, 148 USPQ 479 (1966); Gillette Co. v. S.C. Johnson & Son, Inc., 16 USPQ2d 1923, 1927 (Fed. Cir. 1990). In light of this standard, it is respectfully submitted that the cited art, as a whole, is not suggestive of the presently claimed invention. More specifically, Applicant respectfully submits, as described above, that Kraig and Schnell teach away from Mendham, and as such, supports the nonobviousness of the present invention. Consequently, the presently pending claims are patentably distinguishable from the cited combination.

In addition, and to the extent understood, no combination of Kraig, Schnell, and Mendham describes or suggests the claimed invention. Specifically, Claim 4 depends from Claim 1 recites "a method for fabricating a rotor blade for a gas turbine engine, said method comprising forming an airfoil including a first side wall and a second side wall that each extend in radial span between an airfoil root and an airfoil tip, and wherein the first and second side walls are connected at a leading edge and at a trailing edge...and forming a winglet that is positioned a distance from the leading edge and trailing edge and extends outwardly from at least one of the airfoil first side wall and the airfoil second side wall and positioned a radial distance from the airfoil tip, such that a radius extends between the winglet and at least one of the airfoil first side wall and the second side wall."

No combination of Kraig, Schnell, and Mendham, describes or suggests a method for fabricating a rotor blade for a gas turbine engine, wherein the method includes forming an airfoil including a first side wall and a second side wall that each extend in radial span between an airfoil root and an airfoil tip, and wherein the first and second side walls are connected at a leading edge and at a trailing edge and forming a winglet that is positioned a distance from the leading edge and trailing edge and extends outwardly from at least one of the airfoil first side wall and the airfoil second side wall and positioned a radial distance from the airfoil tip, such that a radius extends between the winglet and at least one of the airfoil first side wall and the second side wall. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge, and Mendham describes removing a portion of an airfoil utilizing an electro-chemical machining process. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Kraig or Schnell in view of Mendham.

Claim 4 depends directly from independent Claim 1. When the recitations of Claim 4 are considered in combination with the recitations of Claim 1, Applicants submit that Claim 4 likewise is patentable over Kraig or Schnell in view of Mendham.

Claim 6 recites “an airfoil for a gas turbine engine, said airfoil comprising a leading edge...a trailing edge...a tip...a first side wall extending in radial span between an airfoil root and said tip, said first side wall defining a first side of said airfoil...a second side wall connected to said first side wall at said leading edge and said trailing edge, said second side wall extending in radial span between the airfoil root and said tip, said second side wall defining a second side of said airfoil...and a winglet positioned a distance from the leading edge and trailing edge and extending outwardly from at least one of said first side wall and said second side wall such that a radius extends between said winglet and at least one of said first and second side walls, said winglet is a radial distance from said airfoil tip.”

No combination of Kraig, Schnell, and Mendham, describes or suggests an airfoil for a gas turbine engine, the airfoil includes a leading edge, a trailing edge, a tip, a first side wall extending in radial span between an airfoil root and the tip, the first side wall defining a first

side of the airfoil, a second side wall connected to the first side wall at the leading edge and the trailing edge, the second side wall extending in radial span between the airfoil root and the tip, the second side wall defining a second side of the airfoil, and a winglet positioned a distance from the leading edge and trailing edge and extending outwardly from at least one of the first side wall and the second side wall such that a radius extends between the winglet and at least one of the first and second side walls, the winglet is a radial distance from the airfoil tip. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge, and Mendham describes removing a portion of an airfoil utilizing an electro-chemical machining process. Accordingly, for at least the reasons set forth above, Claim 6 is submitted to be patentable over Kraig or Schnell in view of Mendham.

Claim 13 depends directly from independent Claim 6. When the recitations of Claim 13 are considered in combination with the recitations of Claim 6, Applicant submits that Claim 13 likewise is patentable over Kraig or Schnell in view of Mendham.

Claim 14 recites “a gas turbine engine comprising a plurality of rotor blades, each said rotor blade comprising an airfoil comprising a leading edge, a trailing edge, a first side wall, a second side wall, and at least one winglet extending outwardly from at least one of said first side wall and said second side wall such that a radius is formed between said winglet and at one of said first and second side walls, said airfoil first and second side walls connected axially at said leading and trailing edges, said first and second side walls extending radially from a blade root to an airfoil tip, said at least one airfoil winglet is positioned a distance from the leading edge and trailing edge and is a radial distance from said airfoil tip.”

No combination of Kraig, Schnell, and Mendham, describes or suggests a gas turbine engine that includes a plurality of rotor blades, each rotor blade includes an airfoil including a leading edge, a trailing edge, a first side wall, a second side wall, and at least one winglet extending outwardly from at least one of the first side wall and the second side wall such that a radius is formed between the winglet and at one of the first and second side walls, the airfoil first and second side walls are connected axially at the leading and trailing edges, the

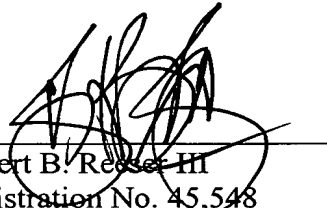
first and second side walls extending radially from a blade root to an airfoil tip, the at least one airfoil winglet is positioned a distance from the leading edge and trailing edge and is a radial distance from said airfoil tip. Rather in contrast to the present invention, Kraig appears to describe a fan blade with a contour that extends substantially radially from the tip of the blade through the blade to the root of the blade, Schnell describes a fan blade including plurality of collars that extend along the width of the blade to a leading edge, and Mendham describes removing a portion of an airfoil utilizing an electro-chemical machining process. Accordingly, for at least the reasons set forth above, Claim 14 is submitted to be patentable over Kraig or Schnell in view of Mendham.

Claim 15 depends directly from independent Claim 14. When the recitations of Claim 15 are considered in combination with the recitations of Claim 14, Applicant submits that Claim 15 likewise is patentable over Kraig or Schnell in view of Mendham.

For at least the reasons set forth above, Applicant respectfully requests that the Section 103 rejection of Claim 4, 13, and 15 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



Robert B. Reiser III
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070